

5.9 Problem Solving and Linear Relationships

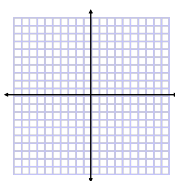
In pairs;  
Find the Pt of Intersection between two lines

$$y = 3x - 2 \quad y = -2x + 8$$

Option #1 Solve Graphically

Option #2 Solve Trial and Error  
Table of Values  
Substitution

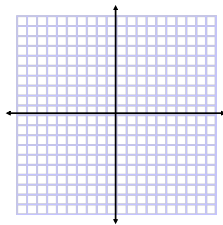
Option #3 Solve Algebraically



Apr 25-7:39 AM

5.9 Problem Solving and Linear Relationships

Finding the Pt of Intersection between two lines

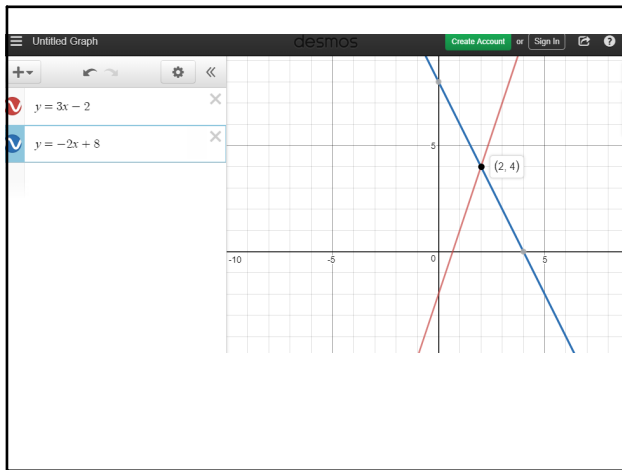
$$y = 3x - 2 \quad y = -2x + 8$$


$(x, y)?$

What properties exist at this point of intersection?  
*The same coordinates - on both lines*

How can you prove this property?

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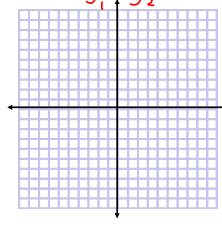
Nov 9-8:28 AM

5.9 Problem Solving and Linear Relationships

Finding the Pt of Intersection between two lines

$$y_1 = 3x - 2 \quad y_2 = -2x + 8$$

$y_1 = y_2$



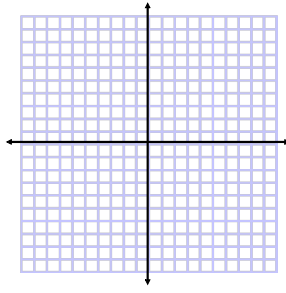
$(x, y)?$

What properties exist at this point of intersection?

How can you prove this property?

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Solve Pt of Intersection

$$y_1 = 4x - 5 \quad y_2 = x + 1$$


Pt of Int  
 $(2, 3)$

Apr 27-11:57 AM

Solve Pt of Intersection Algebraically

$$y_1 = 4x - 5 \quad y_2 = x + 1$$

$$y_1 = y_2$$

$$4x - 5 = x + 1$$

$$4x - x - 5 = +1$$

$$3x - 5 = 1$$

$$3x = 1 + 5$$

$$3x = 6$$

$$x = 2$$

Pt of Int  
 $(2, 3)$   
x y

$$y_2 = x + 1$$

$$y_2 = 2 + 1$$

$$y = 3$$

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Solve Algebraically Steps

$$y = 3x + 6 \quad \& \quad -16x + 2y = -10$$

$$y_1 = y_2$$

$$3x + 6 = 8x - 5$$

$$3x + 6 + 5 = 8x$$

$$2x + 11 = 8x$$

$$11 = 3x - 3x$$

$$11 = 5x$$

$$\frac{11}{5} = x$$

$$y = 3x + 6$$

$$y = 3\left(\frac{11}{5}\right) + 6$$

$$y = \frac{33}{5} + 6$$

$$y = \frac{33}{5} + \frac{30}{5}$$

$$y = \frac{63}{5}$$

POI  $\left(\frac{11}{5}, \frac{63}{5}\right)$

Apr 25-7:43 AM

Solve Algebraically Steps

$$y_1 = 3x + 6 \quad \& \quad y_2 = 8x - 10$$

$$y_1 = y_2$$

$$3x + 6 = 8x - 10$$

$$6 + 10 = 8x - 3x$$

$$16 = 5x$$

$$\frac{16}{5} = x$$

$$y = 3x + 6$$

$$y = 3\left(\frac{16}{5}\right) + 6$$

$$y = \frac{48}{5} + 6$$

$$y = \frac{48}{5} + \frac{30}{5}$$

$$y = \frac{78}{5}$$

POI  $\left(\frac{16}{5}, \frac{78}{5}\right)$

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$$y = 4x - 3 \quad 2x + 3y = 6$$

$$y_1 = y_2$$

$$4x - 3 = -\frac{2}{3}x + 2$$

$$12x - 9 = -2x + 6$$

$$12x - 9 = -2x + 6$$

$$12x + 2x = 6 + 9$$

$$14x = 15$$

$$x = \frac{15}{14}$$

$$y = 4x - 3$$

$$y = 4\left(\frac{15}{14}\right) - 3$$

$$y = \frac{60}{14} - 3$$

$$y = \frac{60}{14} - \frac{42}{14}$$

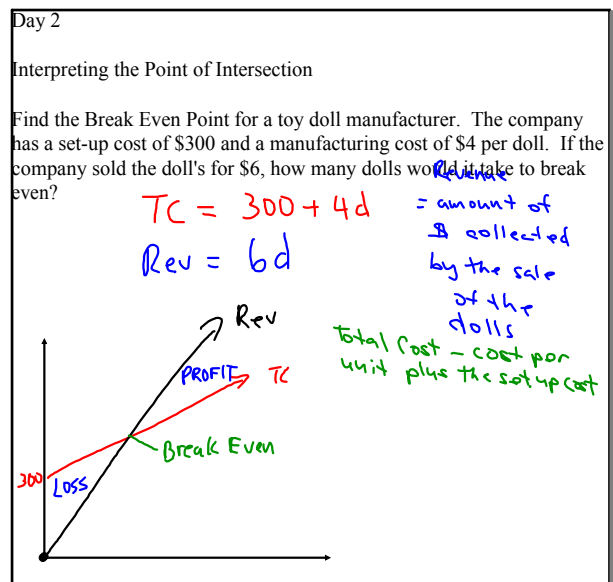
$$y = \frac{18}{14}$$

POI  $\left(\frac{15}{14}, \frac{18}{14}\right)$

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Hmk. p. 326-327 q. 1, 2 a)c)e)m)o)q), 4-7, 9-12

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$$\begin{aligned}
 TC &= 300 + 4d & Rev &= 6d \\
 y_1 &= 4x + 300 & y_2 &= 6x \\
 y_1 &= y_2 \\
 4x + 300 &= 6x \\
 300 &= 6x - 4x \\
 300 &= \frac{2x}{2} \\
 150 &= x
 \end{aligned}$$

$y_2 = 6x$   
 $y_2 = 6(150)$   
 $y_2 = 900$   
 At of Intersection  
 $(150, 900)$

Apr 27-2:54 PM

At 150 dolls the toy doll manufacturer will break even at \$900. Before 150 dolls the company will lose money. After 150 dolls the company will earn a profit.

Apr 27-3:01 PM

p158 q6 Cost Comparison  
 $x = \# \text{ of movies}$

$$\begin{aligned}
 \text{Movies to Go} &= 2.50x \\
 \text{Video rentals} &= 2.00x + 10 \\
 y_1 &= 2.50x & y_2 &= 2.00x + 10 \\
 y_1 &= y_2 \\
 2.50x &= 2.00x + 10 \\
 2.50x - 2.00x &= 10 \\
 .50x &= \frac{10}{0.50} \quad \frac{10}{0.50} \\
 x &= 20
 \end{aligned}$$

$y_1 = 2.50x$   
 $y_1 = 2.50(20)$   
 $y = 50$

At 20 movies both stores will charge \$50. At less than 20 movies Movies to Go is cheapest. After 20 movies Video rentals is cheapest.

p158 q159 q 7, 9, 10 q 11

Apr 27-3:05 PM